REMARKS

In the Office Action, claims 1-27 and 37-45 were rejected. By the present Response, claims 1, 3, 11, 12, 15, 16, 19, 37, 39, 41, and 42 have been amended and new claims 46-50 have been added. Upon entry of the amendments, claims 1-27 and 37-50 will be pending in the present patent application. Reconsideration of the rejections and allowance of all pending claims are respectfully requested.

Objections to the Claims

Claims 10 and 43 were objected to because of the Examiner's assertion that the claims are identical. However, Applicants respectfully point out that claims 10 and 43 are not identical. Claim 43 is directed to a "proportional-integral" (PI) controller, whereas claim 10 is directed to a "proportional-integral-derivative" (PID) controller. As will be appreciated by those of ordinary skill in the art, a proportional-integral controller is not identical to a proportional-integral derivative controller. Withdrawal of the objections is respectfully requested.

Rejection Under 35 U.S.C. § 102

Claims 1, 2, 8, 9, 11, 12, 16 and 18 were rejected under 35 U.S.C. § 102(b) as being anticipated by Chen (U.S. 5,033,720). Claims 1, 11, 12, 15, and 16 were amended by this response.

Amended independent claim 1 is not anticipated because the Chen reference does not disclose all of the recited features of the claims. Among the recited features of claim 1 that are not disclosed by Chen is "a controller...operable to receive programming instructions to selectively increase and decrease workpiece temperature at a desired rate of change and to automatically control operation of the power source to provide inductive heat to the workpiece to selectively increase and decrease the workpiece temperature at the desired rate of change." The Chen reference discloses a metal specimen and using a programmable controlling device 32 to control heating the metal specimen to an elevated temperature. However, Chen does not disclose raising the specimen to the elevated temperature at a desired rate of change. Furthermore, Chen

discloses the use of liquid nitrogen to instantly quench the specimen and, thereby, reduce the temperature of the specimen. *See* Chen, column 3, lines 43-45. However, the application of liquid nitrogen to the specimen does not enable the specimen to be cooled down at a desired rate of change. In fact, in Fig. 3 of Chen, the reduction in temperature caused by the liquid nitrogen is uncontrolled and virtually instantaneous. Furthermore, by using liquid nitrogen to reduce the specimen temperature, the programmable controlling device 32 is not using the electric heating wire 34 to provide heat to the workpiece to decrease the workpiece temperature from an elevated temperature to a lower temperature at a desired rate of change. Thus, the Chen reference does not disclose "a controller...operable to receive programming instructions to selectively increase and decrease workpiece temperature at a desired rate of change and to automatically control operation of the power source to provide inductive heat to the workpiece to selectively increase and decrease the workpiece temperature at the desired rate of change," as recited in amended claim 1. Therefore, the Chen reference does not disclose all of the recited features of amended claim 1. Accordingly, claim 1 is not anticipated by the Chen reference.

For the same reasons, the Chen reference also fails to disclose "a controller operable to control operation of the induction heating power source to increase workpiece temperature to an elevated temperature and to reduce workpiece temperature from the elevated temperature to a lower temperature at a desired rate of temperature decrease automatically in response to programming instructions and the workpiece temperature data," as recited in amended claim 11. Furthermore, as noted above, Chen discloses the use of liquid nitrogen for instant quenching of the specimen. *See* Chen, column 3, lines 43-45. However, the application of liquid nitrogen to the specimen does not enable the specimen to be cooled down at a controlled rate of change. Once again, as illustrated in Fig. 3, the specimen essentially is cooled almost instantaneously by the application of the liquid nitrogen, not at a specific rate of temperature decrease. Accordingly, amended claim 11 is believed patentable over the Chen reference.

With regard to amended independent claim 16, among the recited features not disclosed by Chen, the Chen reference fails to disclose "a user interface to enable a user to provide the

programming instructions to the control unit, wherein the user interface enables a user to program the control unit to form a desired workpiece temperature profile by assembling a plurality of segments representative of a heating operation together." As noted above, the Chen reference discloses a programmable controlling device 32. However, the Chen reference does not disclose that the programmable controlling device 32 enables a user to do anything more than input a desired temperature. *See* Chen, column 3, lines 26-55. Accordingly, the subject matter of amended independent claim 16 is believed patentable over the Chen reference.

For all of these reasons, Applicants respectfully submit that the subject matter of independent claims 1, 11, and 16, as well as the claims dependent therefrom, are not anticipated by the Chen reference. Therefore, Applicants respectfully request withdrawal of the Examiner's rejections and allowance of claims 1, 2, 8, 9, 11, 12, 16 and 18.

Rejection Under 35 U.S.C. § 103

Claims 3-7, 10, 13-15, 17, 19-27 and 39-45 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen (U.S. 5,033,720), in view of Amateau et al. (U.S. 5,391,862). Applicants respectfully traverse this rejection.

Claims 3-7, 10, 13-15, 17, 19-27 and 39-45 are patentable because the cited references, either alone or in combination, do not disclose all of the recited features of the claims. In addition, as is discussed in detail below, the claims are patentable because there is no suggestion in the prior art to combine the references. The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been

obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Initially, Applicants note that claims 3-7, 10, 13-15, 17, 19, and 20 depend from independent claims 1, 11, and 16, respectively, which were rejected as being anticipated by the Chen reference. However, the Amateau reference does nothing to obviate the deficiencies of the Chen reference in regard to independent claims 1, 11, and 16. Accordingly, claims 3-7, 10, 13-15, 17, 19, and 20 are believed patentable over the cited combination by virtue of their dependency from independent claims 1, 11, and 16, as well as, by virtue of their own subject matter.

As for amended independent claim 39, neither the Chen, nor the Amateau reference, discloses a controller "operable to heat the workpiece at a first rate of temperature increase during a first portion of the workpiece temperature profile and to heat the workpiece at a second rate of temperature increase during a second portion of the workpiece temperature profile." As noted above, the Chen reference discloses a programmable controlling device 32. However, the programmable controlling device 32 of Chen is not operable to heat a workpiece at a desired rate of temperature increase, much less to heat a workpiece at a first rate of temperature increase during a first portion of a temperature profile and to heat the workpiece at a second rate of temperature increase during a second portion of the workpiece temperature profile. Similarly, the Amateau reference does not disclose heating a workpiece at either a first or a second desired rate of temperature increase. Rather, the Amateau reference simply discloses heating a gear above its critical temperature to an initial temperature. *See* Amateau, col. 5, lines 50-53. There is no disclosure in Amateau regarding heating the gear at a desired rate of temperature increase. Accordingly, the subject matter of claim 39 is believed patentable over the Chen and Amateau references.

In addition, the Examiner relies on the Amateau reference for evidence of a user interface. However, the Amateau reference does not disclose a user interface that "enables a *user* to establish a *sequence* of inductive heating operations to be performed automatically by the

induction heating system from a selection of inductive heating operations," as recited in claim 21. Furthermore, the Examiner does not provide any evidence of these features. In the Office Action, the Examiner stated that "The programmable device [of Amateau] allows the user to control the process with a sequence of operations or 'program' using a series of commands which are stored for execution according to the sensed temperature of the objects and other parameters (see Figures 1 and 2 and col. 6, line 20 – col. 7, line 28)." However, there is nothing in this statement, or the Amateau reference, to suggest that Amateau "enables a *user* to establish a *sequence* of inductive heating operations to be performed automatically by the induction heating system from a selection of inductive heating operations," as recited in claim 21. The Amateau reference is directed to performing a specific series of manufacturing operations on a gear, including induction heating and quenching. There simply is nothing in the Amateau reference to suggest that a *user* could establish the sequence of induction heating operations in the system of Amateau, much less establish the sequence of induction heating operations from a selection of inductive heating operations. In fact, there is nothing to suggest that there is more than one induction heating operation performed in the Amateau reference. Most importantly, Amateau specifically states that: "The software used for these functions are preinstalled prior to operation and the algorithms contained in the software are considered part of the invention." *See* Amateau, column 6, lines 20-30. Thus, there is no suggestion in the Amateau reference that a *user* could establish a *sequence* of induction heating operations. Therefore, the cited references fail to disclose or suggest all of the recited features of independent claim 21.

Similarly, the cited reference fail to disclose a user interface that "enables a user to establish a sequence of heating operations from a selection of heating operations that may be performed automatically by the system," as recited in claim 37, or "enables a user to establish a sequence of heating operations to be performed automatically by the workpiece heating system by selecting specific heating operations from a plurality of heating operations," as recited in claim 41. Accordingly, the subject matter of claims 21, 37, and 41 are believed patentable over the cited combination.

Furthermore, the cited combination fails to disclose a "portable" control unit, as recited by claim 41. In the Office Action, the Examiner stated that: "Although Chen does not specify that the recorder, the system controller and power source are portable, to use a portable device would be obvious as the use of portable computers are well known for convenience." However, heating systems are not portable computers. In fact, heating systems may be used in a manufacturing facility, such as an assembly line. Indeed, the systems of Chen and Amateau are not portable. Furthermore, a heating system may be comprised of different components, such as a power source and a power source controller. Making these components portable affects how the components are assembled. Therefore, a heating system comprising a portable power source and/or a portable power source controller is not obvious. Accordingly, Applicants respectfully submit that the subject matter of independent claim 41 is patentable over the cited combination for this reason as well. In addition, the use of proportional-integral-derivative (PID) control in a power source controller is not a matter of mere design choice. The Examiner is respectfully requested to provide evidence of such.

Furthermore, the cited claims are patentable because there is no suggestion in the prior art to combine the references. In the Office Action, the Examiner stated that: "It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Chen to use any well known programmable device with user interface to program the heating process according to the temperature feedback system for a better and more precise heating profile, in view of the teaching of Amateau." However, there is nothing in the Amateau reference to suggest that the system of Amateau provides "a better and more precise heating profile" than the system of Chen. Furthermore, Chen already discloses a programmable controlling device 32 and the use of temperature feedback. *See* Chen, column 3, lines 52-55. Thus, the Amateau reference adds nothing to the operation of the Chen reference. However, when prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988).

Therefore, the claims are patentable because there is no desirability in making the suggested combination.

Accordingly, Applicants respectfully submit independent claims 21, 37, and 41, as well as the claims dependent therefrom, are patentable over the cited combination. Therefore, Applicants request withdrawal of the Examiner's rejections and allowance of claims 21-27 and 37-42.

New Claims

New claims 46-50 have been added by this response. New claims 46-50 add no new matter and are fully supported throughout the specification. No fees are believed due for the addition of claims 46-54 because of the cancellation of a greater number of independent claims and total claims in a previous response. Applicants believe that claims 46-50 are patentable over the cited references and in condition for allowance.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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